



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 180  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/732,741	12/10/2003	Yunbo Cao	M61.12-0555	6672

27366 7590 02/15/2007  
WESTMAN CHAMPLIN (MICROSOFT CORPORATION)  
SUITE 1400  
900 SECOND AVENUE SOUTH  
MINNEAPOLIS, MN 55402-3319

EXAMINER

COUGHLAN, PETER D

ART UNIT	PAPER NUMBER
----------	--------------

2129

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/15/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/732,741

Applicant(s)

CAO ET AL.

Examiner

Peter Coughlan

Art Unit

2129

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 November 2006.  
2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 and 11-36 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-9 and 11-36 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 12/10/2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_.

## Detailed Action

1. This office action is in response to an AMENDMENT entered November 28, 2006 for the patent application 10/732741 filed on December 10, 2003.
2. All previous Office Actions are fully incorporated into this Non-Final Office Action by reference.

### ***Status of Claims***

- 3 Claims 1-9, 11-36 are pending.

### ***35 USC § 101***

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-9, 11-36 are rejected under 35 U.S.C. 101 for nonstatutory subject matter. The computer system must set forth a practical application of that § 101 judicial exception to produce a real-world result. Benson, 409 U.S. at 71-72, 175 USPQ at 676-77. The invention is ineligible because it has not been

Art Unit: 2129

limited to a substantial practical application. A collaboration bootstrapping algorithm that improves both classifiers is still an abstract. Please see the interim guidelines for examination of patent applications for patent subject matter eligibility published November 22, 2005 in the official gazette.

In determining whether the claim is for a "practical application," the focus is not on whether the steps taken to achieve a particular result are useful, tangible and concrete, but rather that the final result achieved by the claimed invention is "useful, tangible and concrete." If the claim is directed to a practical application of the § 101 judicial exception producing a result tied to the physical world that does not preempt the judicial exception, then the claim meets the statutory requirement of 35 U.S.C. § 101.

The classification of data is an abstract concept. Using the classifications for a purpose or function is what is needed for the invention to have a tangible result.

The invention must be for a practical application and either:

- 1) specify transforming (physical thing) or
- 2) have the FINAL RESULT (not the steps) achieve or produce a useful (specific, substantial, AND credible), concrete (substantially repeatable/ non-unpredictable), AND tangible (real world/ non-abstract) result.

A claim that is so broad that it reads on both statutory and non-statutory subject matter, must be amended, and if the specification discloses a practical application but the claim is broader than the disclosure such that it does not require the practical application, then the claim must be amended.

Art Unit: 2129

Claims that recites a computer that solely calculates a mathematical formula for classification only is not statutory.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 22, 27, 36 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. These claims contain a reference to the 'formation of a classification module'. The specification contains no information about a 'classification module.' The Examiner does not have a clear understanding of what the input, output or the functions that take place within the classification module. These claims state, 'based at least in part on the first classifier and the second classifier', which is not clearly defined.

These claims must be amended to fit the specification or withdrawn from consideration.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-9, 11-13, 18-25, 27-36 are rejected under 35 U.S.C. 102(a)

(hereinafter referred to as **Lian**) being anticipated by Lian, 'Uncertainty Reduction in Collaborative Bootstrapping: Measure and Algorithm'.

**Claim 1**

Lian anticipates receiving labeled data (**Lian**, p5, C2:33-38; 'Labeled data' of applicant is equivalent to 'labeled training set' of Lian.); receiving unlabeled data (**Lian**, p5, C2:33-38; 'Unlabeled data' of applicant is equivalent to 'unlabeled training set' of Lian.); constructing a first classifier and a second classifier using the labeled data (**Lian**, p2, C2:26-36; 'First and second classifier' of applicant is equivalent to the functions  $h_1$  and  $h_2$  of Lian.); performing uncertainty reduction comprising: selecting a instances from the unlabeled data that are uncertain with respect to the first classifier (**Lian**, p3, C1:27-34; 'Uncertain with respect to the first classifier' of applicant is equivalent to ' $U(h_1) = P(\{x \mid h_1(x) = \perp, x \in X\})$ ' of

Art Unit: 2129

Lian.); and selecting instances from the unlabeled data that are uncertain with respect to the second classifier (**Lian**, p3, C1:27-34; 'Uncertain with respect to the second classifier' of applicant is equivalent to ' $U(h_2) = P(\{x \mid h_2(x) = \perp, x \in X\})$ ' of Lian.); labeling the instances uncertain to the first classifier using the second classifier to form a first labeled set (**Lian**, p3, C2:11-24 'Using the second classifier' of applicant is equivalent to 'with respect to' of Lian. 'Labeling the instance of uncertain' of applicant is equivalent to 'UR' of Lian.  $UR(h_1 \setminus h_2) = P(\{x \mid h_1(x) = \perp, h_2(x) \neq \perp, x \in X\})$ ; and labeling the instances uncertain to the second classifier using the first classifier to form a second labeled set (**Lian**, p3, C2:11-24 'Using the first classifier' of applicant is equivalent to 'with respect to' of Lian. 'Labeling the instance of uncertain' of applicant is equivalent to 'UR' of Lian.  $UR(h_2 \setminus h_1) = P(\{x \mid h_2(x) = \perp, h_1(x) \neq \perp, x \in X\})$  forming a classification module for labeling data at least in part on the first classifier and the second classifier. (**Lian**, p3, C1:20-30; The 'classification module' of applicant is the combination of both ' $h_1(x)$  and ' $h_2(x)$ ' of Lian.)

## Claim 2

Lian anticipates receiving labeled data includes receiving data assigned to classes and wherein receiving unlabeled data includes receiving data capable of being assigned to classes. (**Lian**, p5, C2:33-38; 'labeled data' of applicant is equivalent to 'labeled training set' of Lian. 'Unlabeled data' of applicant is equivalent to 'unlabeled training sets' of Lian.)

Claim 3

Lian anticipates reconstructing the first and second classifiers using at least the first labeled set. (**Lian**, p1, C2:26-35; 'Reconstruction of the classifiers' of applicant is equivalent to 'improve the performance' of Lian.)

Claim 4

Lian anticipates selecting a instances uncertain to the first classifier includes selecting instances of the unlabeled data as a function of uncertainty. (**Lian**, p5, C1:35-42; 'Selecting an instance' of applicant is equivalent to 'separated the data' of Lian.)

Claim 5

Lian anticipates selecting instances as a function of uncertainty includes calculating probabilities. (**Lian**, p3, C1:27-34; 'Probabilities' of applicant is equivalent to 'P' of Lian.)

Claim 6

Lian anticipates calculating probabilities includes calculating probabilities that the first classifier is unable to label some instances of the unlabeled data. (**Lian**, p3, C1:27-34; 'Probabilities' of applicant is equivalent to 'P' of Lian. 'Unable to label' of applicant is equivalent to 'U(h)' of Lian.)



Art Unit: 2129

Claim 7

Lian anticipates calculating at least one value of uncertainty used to select the instances uncertain to the first classifier. (**Lian**, p5 C1:43 through C2:10; 'Value of uncertainty' of applicant is equivalent to 'uncertainty correlation coefficient (UCC)' of Lian.)

Claim 8

Lian anticipates selecting instances uncertain the first classifier includes selecting instances having uncertainty values relative to a predetermined threshold. (**Lian**, p3, C1:27-34; 'Predetermined threshold' of applicant is equivalent to ' $\theta$ ' of Lian.)

Claim 9

Lian anticipates selecting instances having uncertainty values includes selecting instances having uncertainty values below the predetermined threshold. (**Lian**, p3, C1:27-34; 'Predetermined threshold' of applicant is equivalent to ' $\theta$ ' of Lian.)

Claim 11

Lian anticipates exchanging information between the first labeled and the second labeled set to form at least one shared set. (**Lian**, p1, C1:29 through C2:5; 'Exchanging information' of applicant is equivalent to 'exchanging the labeled data' of Lian.)

Art Unit: 2129

Claim 12

Lian anticipates reconstructing the first and second classifiers using the at least one shared set. (**Lian**, p1, C1:29 through C2:5; 'Reconstructing' of applicant is equivalent to 'training' of Lian.)

Claim 13

Lian anticipates labeling the instances uncertain to the first classifier includes assigning instances in the first labeled set to a first set of classes, and wherein labeling the instances uncertain to the second classifier includes assigning instances in the second labeled set to be a second set of classes (**Lian**, p3, Figure 1; 'Assigning instances' of applicant is equivalent to assigning a value to a class in either language (1 or 2) of Lian.)

Claim 18

Lian anticipates selecting unlabeled data that is relatively certain with respect to the first classifier. (**Lian**, p6, C2:4-9; Lian illustrates the classifiers are driven by 'uncertainty reduction' which selects unlabeled data and asks the other classifier for assistance in classifying it.)

Claim 19

Lian anticipates selecting relative certain unlabeled data includes selecting the most certain unlabeled data with respect to the first classifier. (**Lian**, p6,

Art Unit: 2129

C2:4-9; 'Most certain unlabeled data' of applicant is equivalent to 'most uncertain unlabelled instances' of Lian.)

Claim 20

Lian anticipates selecting instances uncertain to the classifier includes selecting data in the relatively certain data. (Lian, p7, C1:15-21; 'Relative certain data' of applicant is equivalent to 'most certain  $a_y$  instances' of Lian.)

Claim 21

Lian anticipates selecting a instances uncertain to the first classifier includes selecting data not in the relatively certain unlabeled data. (Lian, p7, C1:15-21; 'Not in the relative certain unlabeled data ' of applicant is equivalent to 'most uncertain  $b_y$ ' of Lian.)

Claim 22

Lian anticipates constructing a first classifier and a second classifier using received labeled instances (Lian, p2, C2:26-36; 'First and second classifier' of applicant is equivalent to the functions  $h_1$  and  $h_2$  of Lian.); using the first classifier to select unlabeled instances that are certain with respect to the first classifier (Lian, p3, C1:27-34; 'Uncertain with respect to the first classifier' of applicant is equivalent to ' $U(h_1) = P(\{x \mid h_1(x) = \perp, x \in X\})$ ' of Lian.); selecting instances uncertain with respect to the second classifier data from among the instances

Art Unit: 2129

certain with respect to the first classifier to form a first set of unlabeled instances (Lian, p3, C2:11-24 'Using the second classifier' of applicant is equivalent to 'with respect to' of Lian. 'Labeling the instance of uncertain' of applicant is equivalent to 'UR' of Lian.  $UR(h_1 \setminus h_2) = P(\{x \mid h_1(x) = \perp, h_2(x) \neq \perp, x \in X\})$ ; using the second classifier to select unlabeled instances that are certain with respect to the second classifier (Lian, p3, C1:27-34; 'Uncertain with respect to the second classifier' of applicant is equivalent to ' $U(h_2) = P(\{x \mid h_2(x) = \perp, x \in X\})$ ' of Lian.); and selecting instances uncertain with respect to the first classifier from among the instances certain with respect to the second classifier to form a second set of unlabeled instances; (Lian, p3, C2:11-24 'Using the first classifier' of applicant is equivalent to 'with respect to' of Lian. 'Labeling the instance of uncertain' of applicant is equivalent to 'UR' of Lian.  $UR(h_2 \setminus h_1) = P(\{x \mid h_2(x) = \perp, h_1(x) \neq \perp, x \in X\})$  forming a classification module for labeling textual data to ascertain a meaning of the textual data based at least in part on the first classifier and the second classifier. (Lian, p5, C1:6-9, p3, C1:20-30; 'Textual data' of applicant is equivalent to 'each group had 1000 texts' of Lian. The 'classification module' of applicant is the combination of both ' $h_1(x)$  and ' $h_2(x)$ ' of Lian.)

### Claim 23

Lian anticipates labeling the first set of unlabeled instances using the first classifier to form a first labeled set (Lian, p6, C2:4-9; One classifier uses the other classifier for labeling assistance.); labeling the second set of unlabeled

Art Unit: 2129

instances using the second classifier; and to form a second labeled set (**Lian**, p6, C2:4-9; One classifier uses the other classifier for labeling assistance.); adding the first labeled set and the second labeled set to the received labeled instances to form an augmented set. (**Lian**, p6, C2:4-9; With each classifier helping the other with the resulting classifications performed by the other classifier is equivalent to the 'augmented set' of applicant.)

#### Claim 24

Lian anticipates reconstructing the first classifier and the second classifier using the augmented set. (**Lian**, p6, C2:4-9; With the new classifications which are performed by the other classifier, the results are which added the initial classifier classifications or reconstruction or augmented.)

#### Claim 25

Lian anticipates reconstructing the first and the second classifiers includes iteratively reconstructing the first and the second classifiers for each class of unlabeled instances. (**Lian**, p2, C1:1-19; 'iteratively' of applicant is equivalent to 'repeatedly' of Lian.)

#### Claim 27

Lian anticipates receiving labeled data (**Lian**, p5, C2:33-38; 'Labeled data' of applicant is equivalent to 'labeled training set' of Lian.); receiving unlabeled data (**Lian**, p5, C2:33-38; 'Unlabeled data' of applicant is equivalent to 'unlabeled

Art Unit: 2129

training set' of Lian.); constructing a first classifier and a second classifier using the labeled data (**Lian**, p2, C2:26-36; 'First and second classifier' of applicant is equivalent to the functions  $h_1$  and  $h_2$  of Lian.); using the first classifier to select some of the unlabeled data that is certain with respect to the first classifier (**Lian**, p3, C1:27-34; 'Uncertain with respect to the first classifier' of applicant is equivalent to ' $U(h_1) = P(\{x \mid h_1(x) = \perp, x \in X\})$ ' of Lian.); selecting unlabeled data uncertain with respect to the second classifier from among the unlabeled data that is certain with respect to the first classifier to form a first set of unlabeled data (**Lian**, p3, C2:11-24; 'Using the second classifier' of applicant is equivalent to 'with respect to' of Lian. 'Labeling the instance of uncertain' of applicant is equivalent to 'UR' of Lian.  $UR(h_1 \setminus h_2) = P(\{x \mid h_1(x) = \perp, h_2(x) \neq \perp, x \in X\})$ ; and using the second classifier to select some of the unlabeled data that is certain with respect to the second classifier (**Lian**, p3, C1:27-34; 'Uncertain with respect to the second classifier' of applicant is equivalent to ' $U(h_2) = P(\{x \mid h_2(x) = \perp, x \in X\})$ ' of Lian.); and selecting unlabeled data uncertain with respect to the first classifier from among the unlabeled data that is certain with respect to the second classifier to form a second set of unlabeled data; (**Lian**, p3, C2:11-24; 'Using the first classifier' of applicant is equivalent to 'with respect to' of Lian. 'Labeling the instance of uncertain' of applicant is equivalent to 'UR' of Lian.  $UR(h_2 \setminus h_1) = P(\{x \mid h_2(x) = \perp, h_1(x) \neq \perp, x \in X\})$  forming a classification module for labeling textual data to ascertain a meaning of the textual data based at least in part on the first classifier and the second classifier. (**Lian**, p5, C1:6-9, p3,

Art Unit: 2129

C1:20-30; 'Textual data' of applicant is equivalent to 'each group had 1000 texts' of Lian. The 'classification module' of applicant is the combination of both ' $h_1(x)$  and  $h_2(x)$ ' of Lian.)

Claim 28

Lian anticipates receiving unlabeled data includes receiving data capable of being assigned to classes, and wherein receiving labeled data includes receiving data assigned to classes. (Lian, p5, C2:33-38; 'labeled data' of applicant is equivalent to 'labeled training set' of Lian. 'Unlabeled data' of applicant is equivalent to 'unlabeled training sets' of Lian.)

Claim 29

Lian anticipates reconstructing the first and the second classifier for each class. (Lian, p6, C2:4-9; With each classifier helping the other with the resulting classifications performed by the other classifier is equivalent to the 'augmented set' of applicant. With the new classifications which are performed by the other classifier, the results are which added the initial classifier classifications or reconstruction.)

Claim 30

Lian anticipates applying the first classifier to the first unlabeled set to form a first labeled set; and applying the second classifier to the second labeled set to

Art Unit: 2129

form a second labeled set. (**Lian**, p6, C2:4-9; One classifier uses the other classifier for labeling assistance.)

#### Claim 31

Lian anticipates augmenting the received labeled data with the first labeled set and the second labeled set to form an augmented set. (**Lian**, p6, C2:4-9; With the new classifications which are performed by the other classifier, the results are which added the initial classifier classifications or reconstruction or augmented.)

#### Claim 32

Lian anticipates using the augmented set of labeled data to retrain the first classifier and the second classifier to form a retrained first classifier and a retrained second classifier. (**Lian**, p2, C2:37-46; 'Retraining the first and second classifier' of applicant is equivalent to 'co-training' of Lian.)

#### Claim 33

Lian anticipates applying the first classifier to the first unlabeled set includes calculating probabilities that the first classifier is unable to assign some unlabeled data to classes. (**Lian**, p3, C1:27-34; 'Probabilities' of applicant is equivalent to 'P' of Lian.)



Art Unit: 2129

## Claim 34

Lian anticipates calculating probabilities includes calculating values of uncertainty. (**Lian**, p3, C1:27-34; 'Probabilities' of applicant is equivalent to 'P' of Lian. 'Value of uncertainty' of applicant is equivalent to 'U(h)' of Lian.)

## Claim 35

Lian anticipates calculating values of uncertainty includes calculating values of uncertainty relative to a predetermined threshold. (**Lian**, p3, C1:27-34; 'Predetermined threshold' of applicant is equivalent to ' $\theta$ ' of Lian.)

## Claim 36

Lian anticipates receiving labeled data (**Lian**, p5, C2:33-38; 'Labeled data' of applicant is equivalent to 'labeled training set' of Lian.); receiving unlabeled data (**Lian**, p5, C2:33-38; 'Unlabeled data' of applicant is equivalent to 'unlabeled training set' of Lian.); constructing a first classifier and a second classifier with the received labeled data (**Lian**, p2, C2:26-36; 'First and second classifier' of applicant is equivalent to the functions  $h_1$  and  $h_2$  of Lian.); selecting a portion of unlabeled data that is uncertain for the first classifier (**Lian**, p3, C1:27-34; 'Uncertain with respect to the first classifier' of applicant is equivalent to ' $U(h_1) = P(\{x \mid h_1(x) = \perp, x \in X\})$ ' of Lian.); and assigning classes to the portion of unlabeled data using the second classifier to form a first labeled set (**Lian**, p3, C2:11-24; 'Using the second classifier' of applicant is equivalent to 'with respect to' of Lian. 'Labeling the instance of uncertain' of applicant is equivalent to 'UR' of

Art Unit: 2129

Lian.  $UR(h_1 \setminus h_2) = P(\{x \mid h_1(x) = \perp, h_2(x) \neq \perp, x \in X\})$ ; selecting a portion of unlabeled data that is uncertain for the second classifier (**Lian**, p3, C1:27-34; 'Uncertain with respect to the second classifier' of applicant is equivalent to ' $U(h_2)$  =  $P(\{x \mid h_2(x) = \perp, x \in X\})$ ' of Lian.); and assigning classes to the portion of unlabeled data uncertain for the second classifier using the first classifier to form a second labeled set; (**Lian**, p3, C2:11-24 'Using the first classifier' of applicant is equivalent to 'with respect to' of Lian. 'Labeling the instance of uncertain' of applicant is equivalent to 'UR' of Lian.  $UR(h_2 \setminus h_1) = P(\{x \mid h_2(x) = \perp, h_1(x) \neq \perp, x \in X\})$  forming a classification module for labeling data at least in part on the first classifier and the second classifier. (**Lian**, p3, C1:20-30; The 'classification module' of applicant is the combination of both ' $h_1(x)$  and  $h_2(x)$ ' of Lian.)

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2129

Claims 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Lian, as set forth above, and further in view of Gil ('Formalizing Spider Diagrams', referred to as **Gil**)

Claim 14.

Lian fails to particularly call for the first set of classes and the second set of classes are the same.

Gil teaches teach the first set of classes and the second set of classes are the same. (**Gil**, p2, Fig 1; The class  $B \cap C$  is the same class  $C \cap B$ , just labeled different.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of Lian by illustrating that some data sets can be exactly the same as taught by Gil to have the first set of classes and the second set of classes are the same.

For the purpose of possible future use of deleting one of the two class due to the fact they occupy the same space.

Claim 15.

Lian fails to particularly call for set of classes and the second set of classes are different.

Gil teaches first set of classes and the second set of classes are different.

(**Gil**, p2, Fig 1; Class 'A' and 'B' are different because they don't occupy the same space.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of Lian by

Art Unit: 2129

illustrating not all data sets are exactly the same as taught by Gil to have the first set of classes and the second set of classes are the same.

For the purpose of illustrating the fact that more than one class is needed.

Claim 16.

Lian fails to particularly call for first set of classes and the second set of classes are mutually exclusive.

Gil teaches first set of classes and the second set of classes are mutually exclusive. (Gil, p2, Fig 1; Class 'A' and 'C' are mutually exclusive because they don't occupy any common space.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of Lian by illustrating the fact that some data sets have nothing in common as taught by Gil to have first set of classes and the second set of classes are mutually exclusive.

For the purpose of illustrating the fact there will be no ambiguity between these two classes.

Claim 17.

Lian fails to particularly call for first set of classes and the second set of classes overlap by having classes in common.

Gil teaches first set of classes and the second set of classes overlap by having classes in common. (Gil, p2 Fig 1; The shaded area between class 'B' and 'C' is the intersection between 'B' and 'C'. By definition of intersection, is the

Art Unit: 2129

area (classes) in common between 'B' and 'C'.) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of Lian by illustrating the fact that some data sets do have some common elements as taught by Gil to have first set of classes and the second set of classes overlap by having classes in common.

For the purpose of illustrating the fact there will be ambiguity between these two classes.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over the Lian, as set forth above, and further in view of Kokubo (U. S. Patent Publication 20030144899, referred to as **Kokubo**)

Claim 26.

Art Unit: 2129

Lain fail to particularly call for the computer readable medium of claim 1.

Kokubo teaches the computer readable medium of claim 1. (**Kokubo**, ¶0245) It would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to modify the teachings of Lian by having the system stored on a medium which a computer can use as taught by Kokubo to have the computer readable medium of claim 1.

For the purpose of storing the original version and if convergence occurred or storing an updated or augmented version of the system.

### ***Response to Arguments***

5. Applicant's arguments filed on November 28, 2006 for claims 1-9, 11-36 have been fully considered but are not persuasive.

6. In reference to the Applicant's argument:

This communication is in response to the Office Action mailed on August 28, 2006 and follows an Advisory Action mailed on October 23, 2006. In the Office Action, claims 1-9 and 11-36 were pending.

The Office Action reports that claims 1-9 and 11-36 were rejected under 35 U.S.C. §101 for being directed to nonstatutory subject matter. Applicants disagree and ask for reconsideration of amended independent claims 1, 22, 27 and 36. For claims 1 and 36, the feature, "forming a classification module for labeling data based at least in part on the first classifier and the second classifier"

Art Unit: 2129

has been added. Additionally, for claims 22 and 27, a textual classification module for labeling textual data to ascertain a meaning of the textual data is recited. The United States Patent and Trademark Office issued Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility (the Guidelines) in the Official Gazette Notice of November 22, 2005. In the Guidelines, it is stated that:

"To satisfy §101 requirements, the claim must be practical application of the §101 judicial exception, which can be identified in various ways:

- The claimed invention "transforms" an article or physical object to a different state or a thing.

The claimed invention otherwise produces a useful, concrete and tangible result, based on the factors discussed below." (The Guidelines § IV, C, 2).

The definition of a useful, concrete and tangible result is found in the guidelines. For a result to be "useful" it must satisfy the utility requirement of §101. The United States Patent and Trademark Office's official interpretation of the utility requirement provides that the utility of an invention has to be (i) specific, (ii) substantial, and (iii) credible. (The Guidelines § IV, C, 2, b (1)). A result is "concrete" if it can be assured. "In other words, the process must have a result that can be substantially repeatable or the process must substantially produce the same results again." (The Guidelines § IV, C, 2, b, (3)). A result is "tangible" if it produces "a real world result." (Interim Guidelines § 1V, C, 2, b (2)).

An example of a useful, concrete and tangible result is found in *State Street Bank and Trust Company v. Signature Financial Group Inc.*, 149 F.3d 1368, 47 USPQ 2d 1596 (Fed. Cir., 1998), the case which first set this standard. In *State Steet*, it was stated that "[t]he transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm, formula or calculation because it produces a useful, concrete and tangible result - a final share price momentarily fixed for recording and reporting purposes and even accepted and relied upon by regulatory authorities and in subsequent trades." Thus, the court did not care that a mathematical algorithm was used, only that the end result, the share price, was a useful, concrete and tangible result.

In independent claims 1, 22, 27 and 38 statutory subject matter that has a practical application which produces a useful, concrete and tangible result, the very definition of a practical application. In particular, the amended independent claims recite a classification module for labeling data and a textual classification module for labeling textual data.

Classification modules are useful in many situations for labeling data. These situations include speech and handwriting recognition, web page classification,

Art Unit: 2129

word translation models and news article classification, to name a few. A classification module is also a "concrete" result. Applying the classification module to process data will repeatedly result in data labeling each time the module is used. Thus, the questions can be produced in a repeatable fashion, the definition of a concrete result. Lastly, such a question is a "tangible" result since it is a real world result. As noted in the specification, classification modules can be generated to provide reliable classification of data. Thus, the module is not abstract but a real tangible thing that can be used in data classification.

Since the classification module for labeling data is useful, concrete and tangible, the independent claims produce a useful, concrete and tangible result and therefore has a practical application as required by the Guidelines.

Since the independent claims form useful, concrete and tangible results, the claims that depend therefrom also form such results. As such, claims 1-9 and 11-38 all define statutory processes and do not merely manipulate an abstract idea but instead produce useful, concrete and tangible results.

Examiner's response:

The amended claims are heading in the right direction to overcome the 35 U.S.C. §101 rejection but still fall short. The applicant uses 'State Street Bank and Trust Company v. Signature Financial Group Inc' as an example that the invention produces a useful, concrete and tangible result and the invention produces a useful, concrete and tangible result that parallels 'State Street Bank and Trust Company v. Signature Financial Group Inc.' In response to the appellant cites cases such as State Street Bank when the appellant is clearly distinguishing the real world application of dollar amounts and final share prices of State Street from how the appellant's specification discloses the claimed invention can be used only to classify data. The classification of data is still within the domain of being abstract. Applicant actually admits the stated claims are still in abstract form due to the fact it can be used in many examples such



Art Unit: 2129

as, 'speech and handwriting recognition, web page classification, word translation models and news article classification', whereas the State Street Bank and Trust example is used for only one purpose. That is to find 'dollar amounts and final share prices.' This is why the State Street Bank and Trust example produces a useful, concrete and tangible result and the invention does not. Office Action stands.

7. In reference to the Applicant's argument:

The Office Action further reports that claims 1-9, 11-13, 18-25 and 27-36 were rejected under 35 U.S.C. §102(a) as being anticipated by Lian et al., "Uncertainty Reduction in Collaborative Bootstrapping: Measuring and Algorithm" Additionally, claims 14-17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Lian and Gil ("Formalizing Spider Diagrams") and claim 26 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Lian and Kolrubo (U.S. Patent Application No. 2003/0144899). It is noted that the present inventors are authors of the Lian reference. A supplemental declaration under 37 C.F.R. 1,132 is being prepared to establish that inventors Yunbo Cao and Hang Li are inventors in the Lian reference notwithstanding the authorship of the Lian reference.

In view of the foregoing, Applicants submit that claims 1-9 and 11-36 are in condition for allowance. As such, allowance of the present application is requested.

Examiner's response:

Untill the 'supplemental declaration under 37 C.F.R. 1,132' is submitted that establish Yunbo Cao, Li Lian and Hang Li as inventors, all current art used for the rejection of claims 1-9, 11-36 stand and thus the Office Action stands.

***Examination Considerations***

8. The claims and only the claims form the metes and bounds of the invention. "Office personnel are to give the claims their broadest reasonable interpretation in light of the supporting disclosure. *In re Morris*, 127 F.3d 1048, 1054-55, 44USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. *In re Prater*, 415 F.2d, 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969)" (MPEP p 2100-8, c 2, I 45-48; p 2100-9, c 1, I 1-4). The Examiner has the full latitude to interpret each claim in the broadest reasonable sense. Examiner will reference prior art using terminology familiar to one of ordinary skill in the art. Such an approach is broad in concept and can be either explicit or implicit in meaning.

9. Examiner's Notes are provided to assist the applicant to better understand the nature of the prior art, application of such prior art and, as appropriate, to further indicate other prior art that maybe applied in other office actions. Such comments are entirely consistent with the intent and spirit of compact prosecution. However, and unless otherwise stated, the Examiner's Notes are not prior art but link to prior art that one of ordinary skill in the art would find inherently appropriate.

10. Examiner's Opinion: Paragraphs 8 and 9 apply. The Examiner has full latitude to interpret each claim in the broadest reasonable sense.

***Conclusion***

11. The prior art of record and not relied upon is considered pertinent to the applicant's disclosure.

-U. S. Patent 6434518: Glenn

-U. S. Patent 6405162: Segond

-U. S. Patent 6275789: Moser

-U. S. Patent Publication 20030061023: Menezes

-U. S. Patent Publication 20030203343: Milner

-U. S. Patent Publication 20020198701: Moore

-U. S. Patent Publication 20030191626: Al-Onaizan

-U. S. Patent Publication 20020123982: Masuichi

-U. S. Patent Publication 20020087569: Fischer

-U. S. Patent 6438545: Beauregard

-‘Word translation Disambiguation Using Bilingual Bootstrapping’: Li

-‘Using Bilingual Web Data to Mine and Rank Translations’: Li

-‘Overcoming Language Barriers in the Internet Era – A foreign Language

Reading Assistance System’: Li

-‘Base Noun Phrase Translation Using Web Data and the EM algorithm’:

Cao

-‘Using the web as a bilingual Dictionary’: Nagata

Art Unit: 2129

12. Claims 1-9, 11-36 are rejected.

***Correspondence Information***

13. Any inquiry concerning this information or related to the subject disclosure should be directed to the Examiner Peter Coughlan, whose telephone number is (571) 272-5990. The Examiner can be reached on Monday through Friday from 7:15 a.m. to 3:45 p.m.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor David Vincent can be reached at (571) 272-3687. Any response to this office action should be mailed to:

Commissioner of Patents and Trademarks,

Washington, D. C. 20231;

Hand delivered to:

Receptionist,

Customer Service Window,

Randolph Building,

401 Dulany Street,

Art Unit: 2129

Alexandria, Virginia 22313,

(located on the first floor of the south side of the Randolph Building);

or faxed to:


(571) 273-8300 (for formal communications intended for entry.)

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have any questions on access to Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).



Peter Coughlan

1/25/2007



JOSEPH P HIRL  
PRIMARY EXAMINER  
TECHNOLOGY CENTER 2100